MINUTES
of the
THIRD MEETING
of the
SCIENCE, TECHNOLOGY AND TELECOMMUNICATIONS COMMITTEE

September 13-14, 2012
Mimbres Valley Special Events Center
Deming

The third meeting of the Science, Technology and Telecommunications Committee was called to order by Senator Timothy M. Keller, chair, at 10:20 a.m. on Thursday, September 13, 2012, in the Mimbres Valley Special Events Center in Deming.

Present
Sen. Timothy M. Keller, Chair
Sen. William F. Burt (Sept. 13)
Rep. Jim W. Hall
Rep. Conrad D. James
Rep. Debbie A. Rodella

Absent
Rep. Roberto "Bobby" J. Gonzales, Vice Chair
Rep. Cathrynn N. Brown
Sen. Dede Feldman
Sen. Phil A. Griego
Sen. Linda M. Lopez
Sen. Steven P. Neville
Rep. Nick L. Salazar
Rep. James E. Smith
Rep. Luciano "Lucky" Varela

Advisory Members
Sen. Carlos R. Cisneros
Sen. Richard C. Martinez
Rep. Jane E. Powdrell-Culbert
Rep. Don L. Tripp
Rep. Ray Begaye
Rep. Ben Lujan
Sen. William H. Payne
Rep. Danice Picraux
Sen. John M. Sapien
Rep. Richard D. Vigil

Guest Legislators
Rep. Dona G. Irwin (Sept. 13)
Sen. John Arthur Smith (Sept. 13)

(Attendance dates are noted for those members not present for the entire meeting.)

Staff
Gordon Meeks, Legislative Council Service (LCS)
Jeret Fleetwood, LCS

Guests
The guest list is in the original meeting file.

Handouts

Handouts and other written testimony are in the original meeting file.

Thursday, September 13

Senator Keller began by having members of the committee and staff introduce themselves.

Representative Irwin welcomed the committee to Deming, noting that the Mimbres Valley Special Events Center was actually an old K-Mart building that had been converted using capital outlay funds.

Public/Private Partnerships for Technology Transfer

Former Governor Garrey Carruthers, Arrowhead Center, New Mexico State University (NMSU), provided the committee with testimony regarding how public/private partnerships can be used to speed technology transfer from research to the marketplace. He began by offering a brief history of the Arrowhead Center, noting that it began when former NMSU President Mike Martin wanted separate research and economic development deans at the school, and that Governor Carruthers was named as economic development dean. In developing a business plan for economic development at the school, Governor Carruthers noticed a program at Rice University that used public/private partnerships to convert intellectual property into business development plans, which he adapted to the NMSU plan in the form of the Arrowhead Center.

Governor Carruthers went on to explain that the Arrowhead Center offers a number of services to help develop innovative ideas as actual products or services, including:

- research to help move ideas to the marketplace;
- start-up company launches;
- support for growth of successful companies at the NMSU research park;
- directed learning experiences for students to help expand their skill sets and prepare them for the technology innovation work force; and
- analysis of the impact of public policies on the economy.

Governor Carruthers also discussed some of the other ways the Arrowhead Center helps with technology transfer, such as offering college credit to those students who successfully obtain patents for inventions they have developed and offering classes on goals and objectives. He also discussed some of the collaborative efforts between the center and New Mexico's two national laboratories, noting that Los Alamos National Laboratory has been particularly generous with helping the center with patent applications.

Governor Carruthers went on to note that patent ideas may be taken from the Arrowhead Center to NMSU's Manufacturing Technology and Engineering Center, where they can be tested and improved. He also discussed the school's business park, which he explained is a public/private land development partnership between NMSU and industry that recruits both

private sector and government tenants. Governor Carruthers pointed out that a current tenant of the park is an early college high school, which offers college credit to high school students while simultaneously addressing the high school dropout problem in Dona Ana County. He indicated the school is about two years old and has a zero percent dropout rate.

Questions and comments from the committee included:

- in addition to the one in Las Cruces, early college high schools have been successfully implemented in Texas and North Carolina;
- tax structure and the work force are often cited as reasons businesses choose neighboring states over New Mexico;
- remodeling the tax structure should involve some tracking of whether incentives actually work and possibly moving to a grant program;
- the Arrowhead Center tends to focus more on small start-up companies than on large established companies;
- both graduate and undergraduate students from all six NMSU schools work together at the Arrowhead Center;
- venture capital funding tends to follow ideas, while the bigger problem in New Mexico seems to be at the angel investor level;
- early college high schools have no impact on school budgets and came about through a public/private partnership;
- emphasis currently seems to be on bigger high schools, but research shows that the most productive schools tend to be much smaller;
- developing a consistent conduit for technology transfer partnerships will cost additional money, but it could help speed up the technology transfer process;
- the early college high school was built with private funds and uses some new architectural concepts;
- the process for college credit at early college high schools may need to be streamlined at the major college level;
- on average, most New Mexico universities seem to have older students; and
- the legislature is willing to help encourage more public/private partnerships.

Electric Grid Innovations

Mark D'Antonio, Public Service Company of New Mexico (PNM), began by noting the importance of renewable energy to PNM and its overall portfolio.

Jon Hawkins, manager of advanced technology and strategy, PNM, discussed battery storage research being conduced by PNM. He explained that solar energy is an intermittent power resource, with output changing in seconds, rather than minutes, on a cloudy day. Mr. Hawkins also pointed out that peak electricity demand hours do not coincide with peak solar output times, noting that the goal of battery storage is to be able to smooth intermittency and create a dispatchable renewable resource that successfully integrates with utility operations.

Mr. Hawkins went on to discuss tests that PNM has run on solar batteries at its test

facility near Mesa del Sol in Albuquerque. He explained that battery storage has shown promise in being able to smooth intermittency and shift loads so that power demands can be met. However, he cautioned that cost is still a major challenge for battery technology.

Drew Setter, a lobbyist for ITC Holdings, provided the committee with an overview of the company, explaining that it is the largest independently owned electricity transmission company in the country, with operations in seven states. He went on to note that the company is interested in New Mexico because it believes that the state can benefit from a more comprehensive planning process for transmission. Mr. Setter also discussed a project that ITC worked on in Kansas and Oklahoma that expanded transmission capabilities in that area, noting that Kansas' adoption of clear policies that allowed competition on a level playing field helped pave the way for the project. He recommended that prior to moving forward with further transmission development in New Mexico, the state actively participate in interregional planning through a regional transmission organization.

Varney Brandt, Xcel Energy, provided the committee with an overview of Xcel's operations, noting that it has operations in Colorado, Michigan, Minnesota, New Mexico, North Dakota, South Dakota, Texas and Wisconsin.

Steve Fogal, assistant general counsel for Xcel Energy, provided the committee with testimony regarding right-of-first-refusal legislation involving electricity transmission. He explained that the legislation would make it clear that New Mexico prefers that local utilities have the first opportunity to build transmission lines in the state. Mr. Fogal went on to explain that the legislation would help avoid any disruption to the current New Mexico regulatory oversight structure, as well as help the state maintain the quality of transmission service to customers by ensuring that local utilities have control over their own infrastructure.

Jeremy Turner, executive director of the New Mexico Renewable Energy Transmission Authority (RETA), provided the committee with a brief history and overview of the RETA, then discussed the Central New Mexico Collector System Project. He explained that the project involves construction of about 200 miles of transmission lines in New Mexico, which would allow the state to move and export electricity to other states. Mr. Turner pointed out that while the project would cost about $350 million in initial investments, it would result in about $3 billion in renewable energy development in the state, translating to income and jobs for the state. He acknowledged that while this was the first time the RETA has sought additional funding from the legislature, the agency will become completely self-sufficient if the project is completed.

Questions and comments from the committee included:

- that right-of-first-refusal legislation only gives utilities the chance to build transmission lines that interconnect to their generation systems;
- that PNM does have some plans to meet New Mexico's transmission needs and is trying to protect against an outside entity building transmission lines that serve out-of-state customers;

- incentives that might encourage building transmission lines and storage;
- the largest issue in building transmission lines is financing them;
- whether there is a system of incentives in place for renewable energy sources;
- that some federal American Recovery and Reinvestment Act of 2009 funds were used by PNM to build the Mesa del Sol facility;
- development of a business model for charging kiosks for electric cars in Albuquerque;
- the RETA has worked closely with New Mexico military bases on transmission project siting;
- how wind turbines are tied into electric grids;
- work between PNM and Los Alamos National Laboratory on electricity storage legislation;
- the RETA's funding request is for $1.5 million; and
- that right-of-first-refusal legislation exists in at least three other states.

Geothermal Power Development

Nicholas Goodman, chief executive officer of Cyrq Energy, Incorporated, and Chuck Smiley, lightning dock site manager for Cyrq, provided the committee with testimony regarding a geothermal power project that the company is developing in southwestern New Mexico. They began by providing the committee with an overview of geothermal power, explaining that this energy source is used in 24 countries around the world, with the United States having the largest geothermal capacity at 3,187 megawatts. Mr. Goodman and Mr. Smiley went on to note that New Mexico sits atop a world-class geothermal resource but currently produces no geothermal energy. They also discussed geothermal energy as a renewable resource capable of producing baseload capacity, which most other renewable sources cannot do. Mr. Goodman and Mr. Smiley went on to explain that the lightning dock facility, near Lordsburg, is a closed "binary" geothermal system, which features fluid with a low boiling point being pumped at high pressure through a heat exchanger, vaporizing and propelling a turbine. They also provided the committee with a time line for the lightning dock facility, noting that several wells have already been dug and should produce power by the end of 2013. Mr. Goodman and Mr. Smiley indicated that the project would generate about 700 construction jobs, 10 full-time jobs and have an economic impact of about $11 million a year.

Questions and comments from the committee included:

- that no other utility scale geothermal projects exist in New Mexico;
- a bill passed during the 2012 legislative session that helped streamline the process for geothermal power;
- some examination of the royalties process might produce a bill for the 2013 session;
- geothermal wells are expensive to drill and involve some uncertainty as to whether they will be productive;
- once the lightning dock facility is completed, other facilities might be built elsewhere in New Mexico;
- since there is no consumptive use, geothermal power wells do not require a permit from the state engineer; and

- geothermal projects in Los Alamos and Seattle use a different system that relies on hot rocks rather than hot water.

Mark Persons, professor of hydrology for the New Mexico Institute of Mining and Technology (NMIMT), and Shari Kelley, New Mexico Bureau of Geology and Mineral Resources, provided the committee with an overview of geothermal resources in New Mexico. They explained that the state is ranked sixth nationally in geothermal resource potential and is already a leader in the geothermal greenhouse and aquiculture industries. Dr. Persons and Dr. Kelley went on to discuss several geothermal projects in New Mexico, including ones at Rincon and the Pueblo of Jemez. They also discussed the national geothermal database and concerns about geothermal sustainability.

Questions and comments from the committee included:

- a geothermal heating system at NMIMT was never installed because the funding for it was vetoed;
- installing the geothermal heating system at NMIMT would save the state about $800,000 a year in heating costs;
- parasites in Jemez hot springs are mostly a surface phenomenon and likely will not affect the Jemez geothermal project;
- the Jemez geothermal project should not affect flows at Jemez hot springs; and
- issues related to the springs at Truth or Consequences and a moratorium the mayor there placed on additional wells.

Michelle Henry, an attorney with Cyrq, provided the committee with testimony regarding royalties and geothermal projects. She explained that there are basically three types of minerals: privately owned, state-owned and federally owned, and that there are differences between how the federal government and some state governments pay royalties. Ms. Henry went on to note that because the way royalties are calculated by the federal government and New Mexico differ, Cyrq would have to use two separate accounting methods unless New Mexico changes the way it calculates royalties to match the federal government's method.

Hugh Dangler, State Land Office (SLO), explained that the SLO had been involved in meetings regarding different types of rate structures. He noted that the federal method relies more on gross receipts while New Mexico's involves deductions and audits, indicating that since there are some advantages to the federal method, the SLO would prefer to switch to that method.

Questions and comments from the committee included:

- advantages of keeping the royalties system simple to encourage development;
- state statute does not preclude switching royalty calculation methods, but it could still be cleaned up; and
- geothermal energy is used in New Mexico for tilapia farms.

Health Care Technology, Medical Technology and Biotechnology Opportunities

Dr. Richard Larson, vice chancellor for research at the University of New Mexico (UNM) Health Sciences Center, provided the committee with testimony regarding the center's research, social impact and public/private partnerships. He explained that the center has created signature programs in:

- brain and behavioral health research;
- cardiovascular and metabolic diseases;
- infectious diseases and immunity;
- environmental health sciences;
- child health research; and
- cancer.

Dr. Larson also discussed the team problem-solving approach that the center has been using lately, which involves gathering individuals from various medical and non-medical backgrounds and presenting them with a problem. He explained that engineers and laboratory scientists often have useful ways of diagnosing, approaching and solving problems that can translate to medical uses. Dr. Larson also noted the drug re-purposing work being done by the center, explaining that since the average drug costs about $1 billion to produce, it pays to find out if it might be good for more than one use.

Finally, Dr. Larson discussed Project ECHO, which he said uses information technology resources to empower primary care clinicians in rural and underserved areas to safely and effectively manage patients with complex chronic conditions.

Questions and comments from the committee included:

- Medicaid costs that might be saved by Project ECHO;
- patented and generic drug differences;
- patents and the federal Food and Drug Administration process for drug re-purposing;
- the epidemic of prescription drug abuse;
- the biotechnology component of the new UNM president's listening tour;
- that federal money helped increase seed money for more public/private partnerships; and
- UNM does not make much money from patents, as most schools actually lose money on the process.

The committee recessed at 5:25 p.m.

Friday, September 14

The committee toured the Playas Training and Research Center.